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# Chemical Weed Control in Pasture, Range and Hayland

Cooperative Extension South Dakota State University

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FS 426

# CHEMICAL WEED CONTROL

## IN PASTURE, RANGE AND HAYLAND



Weedfree and Weedy Grassland (Photo Courtesy of SCS)

**Cooperative Extension Service**
**South Dakota State University**
**U. S. Department of Agriculture**

# Chemical Weed Control

## IN PASTURE, RANGE AND HAYLAND

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There are 28 million acres of pastures and rangeland, 2 million acres of native hayland, 2¼ million acres of alfalfa and ½ million acres of tame grass hayland in South Dakota. Many herbaceous and woody plants are present in these grassland areas. Some forbs add to the productivity and are desirable plants. Some may be desirable when found in sparse stands, but become undesirable in heavy stand intensities. Undesirable plants may reduce production of palatable forage, others may reduce the quality of animal products and still others may be poisonous to livestock.

Vigorous forage plants are good weed fighters; therefore, management practices—proper fertilization, drainage of soils where necessary, good mowing and grazing practices, and disease and insect control —which contribute to the vigor of forage plants, aid in preventing weed problems. In some cases they will reduce weed populations. This is particularly true for many annual weeds developing from seed each year.

### WEED CONTROL IN ESTABLISHED GRASSES

Weedy plants that cause problems in grasslands generally can be divided into two groups—herbaceous and woody plants. Control of either group will be much the same in tame or native grasses, cool- or warm-season grasses, in sod-forming or bunch grasses —whether plants are found in pasture, range or hayland. Weed control is a management practice that may be used along with any of several other practices to improve production.

#### Mowing

Mowing and spraying generally are considered the best methods of controlling weeds in pastures. Mowing is a recommended practice for controlling many kinds of weeds, if done at the right time over a 2- to 4-year period. In general, mow herbaceous weeds in the early bud to blossom stage.

Although spraying will control broad-leaved annual weeds such as sunflower, marshelder, ragweed and mustard, these weeds also can be controlled by mowing. Mow when the weeds have made a reasonable amount of growth (6 to 24 inches). If cut too early, they will sprout from the cut stubs and be more difficult to control.

Likewise, many broad-leaved biennials such as gumweed, a number of thistle species and mullein, which can be controlled by spraying, also can be controlled by mowing. These weeds produce a rosette during the first year and a flower stalk and seed the second year. These broad-leaved biennials are difficult to mow the first year, but can be handled like annuals the second year.

Grassy weeds such as foxtail, wild barley, annual bromegrasses (cheat) or quackgrass seldom can be controlled by mowing. These grassy weeds produce new growth after being mowed, as do hay or pasture grasses.

Likewise perennial weeds, including noxious weeds and brush, are difficult to control with mowing. They produce new growth from the roots.

#### Herbicides

Some weed species are favored by the same conditions which favor vigorous growth of forage plants. Where woody plants and perennial herbaceous weeds tend to be undesirable, they must be controlled to achieve efficient production of forage. Several years are necessary to obtain satisfactory control through ordinary management practices, but selective herbicides now are available that give good control of many species of undesirable plants in much less time.

Selective herbicides, by killing unwanted species, may hasten the succession to more desirable plant communities. Many pastures and rangelands are so depleted of desirable species that it would take a long time to recoup losses through natural succession, relying solely on improved grazing management practices. Here seeding adapted forages such as alfalfa and/or grasses may be necessary. Selective control of the undesirable species, along with improved grazing practices, may greatly speed up recovery of native forage plants and other desirable species.

The herbicides 2,4-D, 2,4,5-T, silvex and MCPA are not poisonous to livestock, wildlife, or man at the application rates used to control weeds in forage crops, pastures and rangelands. They do not injure most forage grasses. If no poisonous plants are present in the treated areas, livestock other than milk cows need not be removed during or after the application. Milk

cows should be removed from the pastures for a week after application, because of possible chemical residues in the milk. If poisonous plants are known to occur in pastures or on rangelands, remove the livestock from the area for at least three weeks after treatment. Several herbicides, including 2,4-D, 2,4,5-T, silvex and MCPA are known to produce marked changes in the chemical composition of treated plants. Some herbicides affect the palatability of certain plants. Livestock will graze some treated species that normally they would not eat.

Some plants, such as desirable forbs or browse, soybeans, alfalfa, trees, orchards or gardens, may be injured or killed by these herbicides. When spraying near sensitive crops, exercise caution. Avoid spraying on days when the wind can carry the herbicide towards these crops. Also, when spraying near sensitive crops, use an amine or low-volatile ester form of 2,4-D, 2,4,5-T, silvex and MCPA to avoid vapor drift.

Use chemicals only as recommended on the label. Follow instructions exactly as outlined. Be sure to notice all warnings and cautions.

Use of herbicides is recommended only when the chemicals are registered by the U. S. Food and Drug Administration as to tolerance for application on crops raised for human food and livestock feed. **Read the label first—not afterward!**

## Herbaceous Weeds

Herbaceous weeds are undesirable non-woody plants that normally die back at the end of the growing season. This category includes annual, biennial and perennial species. Generally herbaceous weeds can be controlled with an application of 2,4-D.

**Annual weeds.** Apply the amount of 2,4-D required to kill the weed. The quantity of herbicide required for control varies with the weed species. The same rate of herbicide usually is less effective as the weed matures. **Amounts of 2,4-D required to control numerous weeds at different stages of growth are listed above at right:**

Although annual weeds usually are most easily killed with foliage sprays when they are small, better control sometimes is obtained if spraying is delayed until most of the weeds have emerged. Treatments applied at the most susceptible stage of the early germinating weeds, but before some of the later germinating weeds come up, provide less control than delayed spraying, because weeds emerging after spraying are largely unaffected.

**Growth Height of Plant**

| One-Fourth Pound Per Acre | One-Third Pound Per Acre | One-Half Pound Per Acre |
|---|---|---|
| Kochia, 2-4 inches | Kochia, 4-8 inches | Kochia, over 8 inches |
| Marsh elder, 2-4 inches | Marsh elder, over 4 inches | Cinquefoil |
| Ragweed, 2-4 inches | Ragweed, over 4 inches | |
| Pennycress, 4-6 inches | Pennycress, over 6 inches | Marestail |
| Pigweed, 2-4 inches | Pigweed, over 4 inches | Puncture vine |
| Mustard, 3-6 inches | Mustard, over 6 inches | |
| Lamb's quarters, 4-6 inches | Lamb's quarters, over 6 inches | |
| | Cocklebur, 2-6 inches | Cocklebur, over 6 inches |
| | Sowthistle, annual, 2-6 inches | Sowthistle, annual, over 6 inches |
| | Sunflower, 2-6 inches | Sunflower, over 6 inches |
| | Ladythumb, 2-6 inches | Ladysthumb, over 6 inches |
| | Velvet leaf, 4-6 inches | Velvet leaf, over 6 inches |
| | Wild lettuce, 4-6 inches | Wild lettuce, over 6 inches |
| | Russian thistle, 2-4 inches | Russian thistle, 4-6 inches |
| | Wild buckwheat, 2 leaves | |
| | Morning glory, annual | |
| | Peppergrass, annual | |

**Perennial weeds.** Use ¾ to 2 pounds of 2,4-D per acre to control perennial broad-leaved weeds. Apply when the predominant weeds are in the bud stage of growth. Two applications in one year or repeated annual treatments may be necessary for controlling hard-to-kill perennials.

**Noxious weeds.** Apply 2,4-D twice a year. For field bindweed, Canada thistle or perennial sowthistle, apply ¾ pound of 2,4-D in early June before the weeds start to bud. Treat regrowth, if it appears, during late summer (August 15 to September 15). MCPA may be used in one of the treatments for the thistles. Stands can be reduced 90 to 100% in three years.

Apply 1½ pounds of 2,4-D ester per acre during early May for hoary cress and mid-May for leafy spurge and Russian knapweed. Retreat regrowth in mid-August. The stand can be reduced and seed production can be prevented, but complete elimination seldom is achieved with this treatment.

For more details on noxious weed control, see the fact sheet which discusses the particular weed in question.

**Gumweed.** Apply ¾ pound of 2,4-D ester per acre to kill this biennial weed. The second year's growth generally is in a susceptible stage of growth by early June, but new seedlings seldom emerge until about two weeks later. Delay spraying until late June if this year's seedlings and last year's plants are to be killed with one treatment.

**Biennial thistles.** Apply 1 pound of 2,4-D ester per acre during May or early June to control bull thistle, Flodman thistle, musk thistle, and others. If regrowth occurs, a second treatment of 1 pound per acre of 2,4-D may be made in mid-August.

**Goldenrods.** Apply 1 pound of 2,4-D ester per acre before these perennial weeds are over 6 inches tall, generally before June 1.

**Death camas.** Apply 2 pounds of 2,4-D ester per acre in the spring when this poisonous plant is in the early bud stage of growth.

**Prickly pear.** Apply 2 pounds of silvex (2,4,5-TP) per acre with 6 to 8 ounces of a wetting agent per 100 gallons of spray. Treat this perennial cactus when in the bud to bloom stage of growth. For aerial application, apply in 2 to 4 gallons of diesel oil per acre. The high rates of oil result in a higher initial kill. The percentage of control usually increases the second and third year following applications.

**American wormwood.** This perennial is extremely hard to kill but can be controlled with repeated applications of 2,4-D ester. Apply 4 pounds of 2,4-D per acre in mid-May. Another treatment of 4 pounds per acre may be needed if regrowth appears. The second application should be made near the middle of August.

**Burdock.** Apply ¾ pound of 2,4-D ester per acre before the weed starts to bud, generally before June 15.

**Annual bromegrasses (sometimes called cheatgrass).** Several herbicides appear to have promise for controlling downy brome and Japanese chess in rangeland. However, the cost of herbicide ranges from $2 to $5 per acre and none has been approved by the Federal Drug Administration for use on grazing land.

## Undesirable Woody Plants

Woody plants do not die back to the ground every year. Some woody plants, such as the sagebrushes, may be desirable under certain conditions and undesirable under others. Sparse stands of these species for example, often furnish considerable browse for grazing animals and cover for wildlife. Dense stands, on the other hand, may inhibit desirable range grasses. In these cases, it may be desirable to eliminate or at least reduce the stand of the brushy species. Buckbrush, however, frequently grows in low spots. In eastern South Dakota buckbrush often renders the most productive areas useless for grazing, but in rangeland it is often a valuable forage plant, especially for sheep and deer. Use of chemicals for controlling several woody species is summarized in Table 1.

**Table 1. Chemical Control of Woody Plants in Grazing Land.**

| Brush Species | Herbicide | Pounds Active Ingredients /A. | Application Time | Remarks |
|---|---|---|---|---|
| Willows | 2,4-D* | 2 | Spring. As soon as leaves are fully expanded. | Retreatment generally not necessary. |
| Big Sagebrush | 2,4-D ester + Wetting agent | 2 | Spring. When new twig growth is elongating rapidly. | Use oil no lower than No. 2 diesel for aerial applications. Use water for ground application. |
| Fringed Sagewort | 2,4-D* | 2 | Spring. When new twig growth is elongating rapidly. New growth must exceed 2 inches. | Retreat if new growth appears next spring. |
| Sand Sagebrush | 2,4-D* | 1 | Spring. When new growth is 6 to 8 inches long. | Retreat if new growth appears the next spring. |
| Western Snowberry (Buckbrush) | 2,4-D* | 2 | Spring. As soon as leaves are fully expanded. | Retreatment generally is necessary. |
| Smooth Sumac | 2,4-D* | 2 | Spring. As soon as leaves are fully expanded. | Retreatment generally is necessary. |
| Rabbit Brush | 2,4-D* | 3 | Spring. When new twig growth exceeds 3 inches and plant growth is rapid. | Retreat if new growth appears next spring. |

*Use an ester formulation in an oil-water (1 part oil and 3 parts water) emulsion.

## Weed Control and Fertilization

In order to derive maximum benefits from any fertilizer program, weed control must be carried out prior to or in conjunction with fertilization. Fertilizer will stimulate weed growth, which uses moisture. Forages could make better use of this moisture.

### Weed Control and Interseeding

Any undesirable vegetation should be controlled where interseeding is done or the weeds may impair the value of interseeding. If legumes are interseeded, the weeds should be controlled before the seedlings emerge; however, later treatment may be used if only grasses are interseeded. Herbicides applied after the legume comes up will cause more damage to the crop than the weed. With early emerging weeds, such as goldenrod, it may be possible to interseed in early May and spray the weeds a week or so later, before the legume seedlings emerge. This is not likely to work with weeds, such as gumweed, that do not emerge until late May or early June past the optimum time for interseeding. However, these may be sprayed in June before interseeding is done in the fall.

## WEED CONTROL IN ESTABLISHED LEGUMES

Mechanical methods of weed control are the same as for established grasses, but chemical methods are somewhat different. Diuron (tradename Karmex), simazine (tradename Princep), and 4(2,4-DB) may be used safely to control weeds in established alfalfa.

Use diuron at 2 pounds active ingredient per acre to control annual broad-leaved and grassy weeds. Apply early in the spring while the alfalfa is dormant and before the weeds emerge. Late treatment does not give satisfactory weed control. Do not use on sandy soils as the legume may be injured if the herbicide is leached into the root zone. Treat only stands that have been established for one year or longer.

Use 1 to 1½ pounds active ingredient per acre of simazine to control annual grassy and broad-leaved weeds. Apply after the first killing frost but before the new growth appears in the spring. Do not graze treated areas for 30 days or cut for hay for 60 days after treatment. Do not use on sandy soils. Treat only stands that have been established for one year or more.

Use ½ to 2 pounds of 4(2,4-DB) per acre to control many broad-leaved weeds in legumes. Treat when annual weeds are 2 to 3 inches tall or when perennial weeds are 6 to 8 inches tall. Do not use more than ¾ pound per acre of the ester form on red clover or more than 1 pound per acre of the ester on other legumes. Do not graze treated areas or cut for hay within 30 days following treatment.

## WEED CONTROL IN NEW SEEDINGS

The establishment of new fields of grass, legumes, or a grass-legume mixture sometimes can be a problem when the area is heavily infested with weed seeds. Grass and legume seedlings cannot compete very well with weeds.

### Weed Control in New Grass Seedings

Seedlings of perennial grasses may be treated advantageously with 2,4-D if broad-leaved weeds are a problem. Rates up to ¾ pound of 2,4-D per acre may be used after the grass seedlings have reached the 2- to 4-leaf stage of growth. Reports indicate the cool-season grasses are more tolerant of the spray in the seedling stage than the warm-season grasses. Where weedy annual grasses are the major problem, clipping may be the only successful method of control.

Use ½ to ¾ pound of 2,4-D per acre to control annual broad-leaved weeds infesting cool-season grass seedlings. Use ¼ to ½ pound of 2,4-D per acre to control the same weeds in warm-season grass seedlings, In both warm- and cool-season grass seedlings, the grass should be in at least the 2- to 4-leaf stage of growth.

### Weed Control in New Seedlings of Legumes

Herbicides that may be used in the establishment of legumes differ considerably from those that can be used in grass establishment. Benefin (tradename Balan), EPTC (tradename Eptam), Dalapon (tradename Dowpon) and 4(2-4-DB) can safely be used in legume establishment.

Use 1⅛ to 1½ pounds active ingredient of benefin per acre to control annual grassy and some broad-leaved annual weeds. Benefin should be applied prior to planting and incorporated with the soil immediately after application. Thorough incorporation may be achieved with PTO-driven equipment set to cut 2 to 3 inches deep or a double disk set to cut 3 to 6 inches deep and operated in two different directions, at 4 to 6 mph. Shallow.incorporation with implements set to cut less than 2 inches deep may result in erratic weed control. Spring-tooth or spike-tooth harrows should not be used alone for soil incorporation. Do not use benefin where cereals are used as a nurse crop.

Use 3 to 4 pounds active ingredient per acre of EPTC to control annual grassy and some broad-leaved weeds. Apply prior to planting and incorporate immediately to a depth of 2 to 4 inches. Temporary crop stunting and sealing of the first leaves will occur if conditions for germination and growth are not optimum. Do not use EPTC where cereals are used as a nurse crop.

Use 1 to 2 pounds active ingredient of dalapon per acre to control annual grasses. Apply when the afalfa seedlings are 2 to 3 inches tall. Do not use where cereals are being used for a nurse crop. Do not feed the first year's growth to dairy animals or animals being finished for slaughter. First-year crop should not be sold commercially or shipped interstate.

Use ½ to 1½ pounds of 4(2,4-DB) per acre to control annual and some perennial broad-leaved weeds. Apply when the legume is over 2 inches tall and the weeds less than 3 inches tall. Do not graze or harvest for at least 30 days after treatment. Do not use over ¾ pound per acre on red clover.

## COST OF CHEMICALS

The cost of these chemicals varies from year to year. However, approximate costs of a pound of active ingredient for the herbicides mentioned are:

2,4-D, 80 cents-$1.10; Silvex (2,4-5-T), $2.40; 2,4,5-T, $1.80; MCPA, $1.25; Dalapon, $1.20; EPTC, $2.85; 4(2,4-DB), $2.90; Simazine, $3.30; and Diuron, $3.75.

**Use of a trade name does not indicate endorsement of one product over another.**

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Weedfree and Weedy Grassland (Photo Courtesy of SCS)

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